

Influence of the fungal root endophyte *Piriformospora indica* on tomato growth and spread of *Pepino mosaic virus*

Ahmad Fakhro^{1,2}, Dietmar Schwarz², Susanne von Bargaen¹, Martina Bandte¹, Carmen Büttner¹, Philipp Franken²

¹ Humboldt-Universität zu Berlin, Faculty of Agriculture and Horticulture, Institute for Horticultural Sciences, Section Phytomedicine, Lentzeallee 55/57, D-14195 Berlin, Germany. Phytomedizin@agrار.hu-berlin.de

² Institute of Vegetable and Ornamental Crops, Großbeeren/ Erfurt e.V., Theodor-Echtermeyer-Weg 1, D-14979 Großbeeren, Germany. igzev@igzev.de

Pepino mosaic virus (PepMV) belonging to the genus Potexvirus was first identified in 1974 in pepino plants (*Solanum muricatum* Ait.) in Peru; (Jones et al., 1980). PepMV can infect not only important crops of the family *Solanaceae* like tomato, eggplant (Salomone and Roggero, 2002), pepper (Marchoux et al., 2005) and some cultivars of potato (Martin, et al., 2002), but also different weed species (Cordoba et al., 2004). PepMV was rapidly distributed in the world after it appeared in the protected production of tomato in greenhouse in The Netherlands and in Great Britain in 1999 (van der Vlugt, et al., 2002). A few years later this pathogen affected tomato greenhouse production in most European countries, USA, Canada and China. The virus caused in recent years worldwide a great damage in greenhouse and field production of tomato. The losses were up to 30% in the market yield and even up to 50% concerning the quality of the fruits (Spence et al., 2006). The only method to control plant viruses in the greenhouse is the disinfection of all materials (Bosseur et al., 2004).

The aim of the present work was to analyse whether a containment of this disease with root-endophytic fungi as biological agents is possible. As root colonising fungus the endophyte *Piriformospora indica* was selected. *P. indica* belongs to the Sebaciniales (Basidiomycota). It has a broad host range and increased fresh weights of roots and shoots of many plants (Varma et al. 1999). *P. indica* induces resistance in barley against root and shoot pathogens (Waller et al. 2005), but has not been used up to now for inoculation of tomato.

Tomato plants cultivar Hildares were grown in nutrient solution in hydroponic system and inoculated with spores and mycelium suspensions of the fungus. Three weeks later after controlling fungal colonisation of the roots, leaves were inoculated with PepMV. The spread of the virus was controlled using DAS-ELISA test system with the specific antibody AS-0554 (DSMZ, Braunschweig, Germany). At the end of the experiment plant growth parameters were monitored.

P. indica promoted shoot growth and fruit fresh weights as it has been seen before with other plants on solid substrates. Concerning virus spread, the root endophyte showed a significant influence. In order to get a first insight into the molecular basis, RNA accumulation of a number of genes being related with virus infection in plants was analysed. The results will be presented.